

Lesson 1.4 Skills Practice

NAME

Key

DATE

1

Games and Practice Solving More Linear Equations

Problem Set

Define a variable and write algebraic expressions for each of the given quantities. Then, answer the question by writing and solving an equation.

1. Three siblings collect rare coins. To determine the number of rare coins that Samantha has, take the number of rare coins Kevin has, add 4, and then divide that sum by 2. To determine the number of rare coins Ben has, double the amount of rare coins Kevin has, subtract 4, and then multiply that difference by 2. How many rare coins does each sibling have if they have a total of 49 rare coins?

Let x represent the number of rare coins that Kevin has.

Number of rare coins Samantha has: $\frac{(x + 4)}{2}$

Number of rare coins Ben has: $2(2x - 4)$

$$x + \frac{(x + 4)}{2} + 2(2x - 4) = 49$$

$$2\left(x + \frac{(x + 4)}{2} + 2(2x - 4)\right) = 2(49)$$

$$2x + x + 4 + 4(2x - 4) = 98$$

$$3x + 4 + 8x - 16 = 98$$

$$11x - 12 = 98$$

$$11x - 12 + 12 = 98 + 12$$

$$11x = 110$$

$$\frac{11x}{11} = \frac{110}{11}$$

$$x = 10$$

Number of rare coins Samantha has:

$$\frac{(10 + 4)}{2} = 7$$

Number of rare coins Ben has:

$$2(2(10) - 4) = 32$$

Kevin has 10 rare coins, Samantha has 7 rare coins, and Ben has 32 rare coins.

Lesson 1.4 Skills Practice

Effie = Tony + 9
page 2

1

2. Three teammates had different point totals at the girls' basketball game. To determine the number of points Effie had, multiply Toni's points by 3, subtract 8, and then multiply the difference by 2. To determine the number of points Linda had, add 9 to Toni's points and divide the sum by 3. How many points did each girl have if Effie scored 9 more than Toni and Linda combined?

$$\text{Toni} = T \text{ pts}$$

$$\text{Effie} = 2(3T - 8) \text{ 20 pts}$$

$$\text{Linda} = \frac{T + 9}{3} \text{ 5 pts}$$

$$2(3T - 8) = T + \frac{T + 9}{3} + 9$$

$$3(6T - 16) = T + \frac{T + 9}{3} + 9$$

$$18T - 48 = 3T + T + 9 + 27$$

$$18T - 48 = 4T + 36$$

$$\begin{array}{r} 18T - 48 \\ -4T \\ \hline 14T - 48 \end{array} = \begin{array}{r} 36 \\ +48 \\ \hline 84 \end{array}$$

$$\frac{14T}{14} = \frac{84}{14} \quad T = 6$$

4. Four friends have pre-paid cell phones. To determine the number of minutes Warren has left on his phone, add 20 to the number of minutes Nancy has and divide the sum by 4. To determine the number of minutes Christen has left on her phone, multiply the number of minutes Nancy has by 3, subtract 50, and then divide the difference by 2. To determine the number of minutes Megan has left on her phone, subtract 20 from the number of minutes Nancy has, multiply the difference by 5, and then divide that quantity by 4. How many minutes does each person have left on their phone if they have a total of 195 minutes of time left?

$$\text{Nancy} = N \text{ 60 min left} \quad 4\left(N + \frac{N+20}{4} + \frac{3N-50}{2} + \frac{5(N-20)}{4}\right) = 195$$

$$\text{Warren} = \frac{N+20}{4} \text{ 20 min left}$$

$$4N + N + 20 + 2(3N - 50) + 5(N - 20) = 780$$

$$4N + N + 20 + 6N - 100 + 5N - 100 = 780$$

$$\text{Christen} = \frac{3N-50}{2} \text{ 65 min left}$$

$$\begin{array}{r} 16N - 180 \\ +100 \\ \hline 16N - 80 \end{array} = 780$$

$$\text{Megan} = \frac{5(N-20)}{4} \text{ 50 min left}$$

$$\frac{16N}{16} = \frac{960}{16}$$

$$N = 60$$

NAME _____ DATE _____

1

Solve each equation. Check your solution.

5. $\frac{4(x-8)}{5} = 16$

$$\frac{4(x-8)}{5} = 16$$

$$5\left(\frac{4(x-8)}{5}\right) = 5(16)$$

$$4(x-8) = 80$$

$$4x - 32 = 80$$

$$4x - 32 + 32 = 80 + 32$$

$$4x = 112$$

$$\frac{4x}{4} = \frac{112}{4}$$

$$x = 28$$

Check:

$$\frac{4(28-8)}{5} = 16$$

$$\frac{4(20)}{5} = 16$$

$$\frac{80}{5} = 16$$

$$16 = 16$$

6. $\frac{3x+5}{4} = \frac{2x-2}{2}$

$$4(2x-2) = 2(3x+5)$$

$$8x-8 = 6x+10$$

$$2x-8 = 10$$

$$2x = 18$$

$$x = 9$$

$$\frac{3x+5}{4} = \frac{2x-2}{2}$$

$$3x+5 = 2(2x-2)$$

$$3x+5 = 4x-4$$

$$-x+5 = -4$$

$$-x = -9$$

$$x = 9$$

Check

$$\frac{3(9)+5}{4} = \frac{2(9)-2}{2}$$

$$\begin{array}{r} 27+5 \\ 4 \\ 32 \end{array} \quad \begin{array}{r} 18-2 \\ 2 \\ 16 \end{array}$$

$$7. \widehat{5(x-4)} + \widehat{8(2x+2)} = \widehat{6(x+1)} + \widehat{5(x+10)}$$

$$\widehat{5x-20} + \widehat{16x+16} = \widehat{6x+6} + \widehat{5x+50} \quad \times \text{ Distribute}$$

$$\begin{array}{r} 21x - 4 \\ +4 \\ \hline \end{array} = \begin{array}{r} 11x + 56 \\ +4 \\ \hline \end{array}$$

\times Combine like terms

$$\begin{array}{r} 21x \\ -11x \\ \hline \end{array} = \begin{array}{r} 11x + 60 \\ -11x \\ \hline \end{array}$$

\times Undo

$$\begin{array}{r} 10x \\ 10 \\ \hline \end{array} = \begin{array}{r} 60 \\ 10 \\ \hline \end{array}$$

$$x = 6$$

$$8. \frac{-5(x-2)}{2} = \frac{2-8x}{6}$$

$$\frac{3 \cdot \frac{-5x+10}{2}}{1} = \frac{2-8x}{6} \cdot \frac{6}{1}$$

$$\widehat{3(-5x+10)} = 2-8x$$

$$\begin{array}{r} -15x + 30 \\ -30 \\ \hline \end{array} = \begin{array}{r} 2-8x \\ -30 \\ \hline \end{array}$$

$$\begin{array}{r} -15x \\ +8x \\ \hline \end{array} = \begin{array}{r} -27-8x \\ +8x \\ \hline \end{array}$$

$$\begin{array}{r} -7x \\ 7 \\ \hline \end{array} = \begin{array}{r} -27 \\ 7 \\ \hline \end{array}$$

$$x = 4$$